Amendments to the Claims:

Please cancel Claims 1 – 36 and 41 – 52 as indicated in the following listing of claims, which replaces all prior versions and listings of claims in the application.

Listing of Claims:

37. (Original) An ion implantation system comprising:

an ion source having a toroidal plasma generator, and

an ion source aperture aligned essentially along a center line of the toroidal plasma generator.

38. (Original) The ion implantation system of claim 37 further comprising a first extraction electrode disposed to accelerate ions from the ion source toward a second extraction electrode.

39. (Original) The ion implantation system of claim 37 wherein the toroidal plasma generator includes a first core and a second core, the first core and the second core being aligned essentially along a center line of the toroidal plasma generator.

40. (Original) A method of providing ions to an ion implantation system, the method comprising:

providing an ion precursor to a transformer-coupled toroidal plasma generator in an ion source;

ionizing at least a portion of the ion precursor into ions, the ions having a greater density at a center of the transformer-coupled toroidal plasma generator and extending along a line through the center of the transformer-coupled toroidal plasma generator; and

ejecting a portion of the ions out of the ion source.

53. (New) The ion implantation system of claim 37 wherein the ion source is a multicore plasma generator comprising:

an inlet configured to receive a plasma precursor, the inlet in fluid communication with a first plasma current path and with a second plasma current path;

a first conduit passing through a first transformer core; and

a second conduit passing through a second transformer core,

wherein the first conduit is essentially colinear with the second conduit.

54. (New) The ion implantation system of claim 37 wherein the ion source is a multicore plasma generator comprising:

an outer shell surrounding a first inner shell housing a first toroidal transformer core; and

a second inner shell housing a second toroidal transformer core, wherein the first toroidal transformer core and the second toroidal transformer core are disposed along the center line.

55. (New) The ion implantation system of claim 54 wherein the first inner shell is supported within the outer shell by a web allowing circulation of secondary plasma current around the first inner shell within the outer shell.

56. (New) The ion implantation system of claim 55 wherein the web contains an electrical lead connected to a primary coil disposed to couple electromagnetic energy to the first toroidal transformer core.

57. (New) The ion implantation system of claim 54 wherein the first inner shell includes a shaped bottom portion to provide a circular cross section to the first inner shell.

58. (New) The method of claim 40 wherein the ion source is a multicore plasma generator comprising:

an outer shell surrounding a first inner shell housing a first toroidal transformer core; and

a second inner shell housing a second toroidal transformer core, wherein the first toroidal transformer core and the second toroidal transformer core are disposed along the center line.

59. (New) The method of claim 58 wherein the first inner shell is supported within the outer shell by a web allowing circulation of secondary plasma current around the first inner shell within the outer shell.

60. (New) The method of claim 59 wherein the web contains an electrical lead connected to a primary coil disposed to couple electromagnetic energy to the first toroidal transformer core.

61. (New) The method of claim 58 wherein the first inner shell includes a shaped bottom portion to provide a circular cross section to the first inner shell.